Appendix K Biological Opinion

1. NOAA Fisheries Biological Opinion: December, 2003

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802- 4213

In Response Reply To:
151422SWR02SR6254:JTJ

DEC 11 2003

Gary N. Hamby
Division Administrator
United States Department of Transportation
Federal Highway Administration
980 Ninth Street, Suite 400
Sacramento, California 95814-2724

Dear Mr. Hamby:

This document transmits the National Marine Fisheries Service's (NOAA Fisheries) biological opinion (Enclosure) based on our review of the Federal Highway Administration's (FHWA) proposed funding for the widening of Highway 101 from Highway 12 to Steele Lane in Santa Rosa, Sonoma County, California (FHWA reference: HDA-CA, File # 04-Son-101-19.5/22.2, Document # P45633) and its effects on threatened Central California Coast steelhead (*Oncorhynchus mykiss*) and designated critical habitat for Central California Coast coho salmon (*O. kisutch*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). In addition, this letter documents the result of NOAA Fisheries' Essential Fish Habitat (EFH) consultation pursuant to section 305(b)(2) of the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA).

Endangered Species Act Consultation

NOAA Fisheries concludes in the biological opinion that the proposed action will not jeopardize the continued existence of Central California Coast steelhead, nor adversely modify designated critical habitat for Central California Coast coho salmon. However, we anticipate that take of listed species as a result of this project will occur, and therefore, an incidental take statement with non-discretionary terms and conditions is included.

Essential Fish Habitat Consultation

NOAA Fisheries has evaluated the proposed project for potential adverse effects to EFH pursuant to section 305(b)(2) of the MSFCMA. After reviewing the effects of the project as described in the enclosed biological opinion, NOAA Fisheries has determined that the proposed action will have a minimal adverse effect on EFH of Chinook salmon (*O. tshawytscha*) and coho salmon in Santa Rosa Creek.

Section 305(b)(4)(A) of the MSFCMA authorizes NOAA Fisheries to provide EFH Conservation Recommendations that will minimize adverse effects of an activity on EFH. For this project, conservation measures were already included in the project description. In addition, the enclosed biological opinion also contains non-discretionary terms and conditions that will minimize adverse effects to EFH. Therefore, NOAA Fisheries has not provided EFH Conservation Recommendations for this project.

If you have any questions about this section 7 consultation and EFH consultation, or if you require additional information, please contact Mr. Jeffrey Jahn at (707) 575-6097.

Sincerely,

for Rodney R. McInnis
Acting Regional Administrator

Enclosure

cc: Joan Bollman, Federal Highway Administration, Sacramento
Chuck Morton, Caltrans, Oakland
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Enclosure

BIOLOGICAL OPINION

AGENCY:	Federal Highway Administration, California Division
ACTION:	Proposed Funding for the Widening of Highway 101 from Highway 12 to Steele Lane in Santa Rosa, Sonoma County, California
CONSULTATION CONDUCTED BY:	National Marine Fisheries Service, Southwest Region
FILE NUMBER:	151422SWR02SR6254
DATE ISSUED:	DEC 11 2003

I. CONSULTATION HISTORY

During the summer of 2001, representatives from the California Department of Transportation (Caltrans) met with the National Marine Fisheries Service (NOAA Fisheries) at the proposed project site along Santa Rosa Creek to discuss the project and to identify potential impacts to listed salmonids. In December 2001, the Federal Highway Administration (FHWA) requested informal consultation with NOAA Fisheries based on a previously issued United States Army Corps of Engineers Clean Water Act permit to the City of Santa Rosa for the Prince Memorial Greenway Project (PMGP). At the time of consultation for the issuance of the permit for the PMGP, the available data indicated that salmonids would not likely be present during implementation of the project. However, low numbers of juvenile steelhead (*Oncorhynchus mykiss*) were present at the project site and had to be relocated to avoid their injury or death from construction activities.

In June 2002, NOAA Fisheries Santa Rosa Area Office was contacted by Caltrans inquiring about the status of the consultation. On July 23, 2002, NOAA Fisheries sent a letter to FHWA requesting additional information on the project, noting that relocation of salmonids would be necessary and thus a formal section 7 consultation was warranted. In August 2002, representatives from Caltrans met again with NOAA Fisheries at the proposed project site along Santa Rosa Creek to discuss the project and to identify potential impacts to salmonids.

Between the summer of 2002 and the spring of 2003, FHWA and Caltrans developed a biological assessment (BA) for the project. By letter dated July 3, 2003, the FHWA requested formal section 7 consultation and submitted the biological assessment for the proposed Highway 101 widening project from State Route 12 to Steele Lane. Acknowledgment of FHWA's request was sent on August 6, 2003. The consultation began on July 7, 2003, when NOAA Fisheries received the BA.

On October 21, 2003, NOAA Fisheries contacted Caltrans by telephone in order to better understand the proposed action and to address inconsistencies in the BA. During that discussion, NOAA Fisheries also notified Caltrans that the biological opinion would not be completed by the November 19, 2003, deadline. NOAA Fisheries explained that completion of the biological opinion was a high priority, but due to workload the completion may be delayed by about one month. On November 21, 2003, Caltrans sent an e-mail to NOAA Fisheries to inquire about the biological opinion and to inform NOAA Fisheries that the project description had changed. On the same day, NOAA Fisheries responded to the e-mail and requested additional information about the changes to the project. Caltrans partially provided the requested information to NOAA Fisheries by e-mail on November 25, 2003. On December 2, 2003, NOAA Fisheries provided a list of questions by e-mail to Caltrans regarding the change in the project and to further clarify the information presented in the BA. Caltrans provided the requested information to NOAA Fisheries by e-mail on December 3, 2003.

This biological opinion is based on information provided in the submitted document titled *Biological Assessment Highway 101 Widening Project from State Route 12 to Steele Lane (April 2003)*, subsequent discussions and submissions, and other sources of scientific and commercial information. A complete administrative record of this consultation is on file in the NOAA Fisheries Santa Rosa Area Office, Santa Rosa, California.

II. DESCRIPTION OF THE PROPOSED ACTION

The FHWA proposes to provide funding to Caltrans for the widening of Highway 101 in Santa Rosa, Sonoma County, California (reference: HDA-CA, File # 04-Son-101-19.5/22.2, Document # P45633). The proposed project will widen Highway 101 (Hwy-101) from four to six lanes in Santa Rosa from Highway 12 to immediately north of Steele Lane. The purpose of the proposed project is to improve the overall travel delay time that is currently experienced between State Route 116 in Cotati and River Road in Fulton during busy AM and PM peak traffic periods. There are two creeks within the project limits, Santa Rosa Creek on the south end and Paulin Creek on the north end. The proposed project includes the demolition and replacement of the Hwy-101 bridge over Santa Rosa Creek and the installation of fish habitat enhancement structures in Santa Rosa Creek upstream of the bridge. According to the BA, the bridge construction is anticipated to take three consecutive construction seasons to complete and is scheduled to be implemented between 2005 and 2007. The installation of the habitat enhancement structures may occur in 2004, during the final phases of PMGP, or may occur in 2007 during the final phase of the project. Construction activities within the Santa Rosa creek channel will be limited to June 15 through October 31 annually.

Because the proposed widening project will not involve any construction work in Paulin Creek, NOAA Fisheries has determined that the proposed project will not adversely affect listed salmonids or coho salmon (*O. kisutch*) critical habitat in Paulin Creek. The following description focuses on the widening of the bridge over Santa Rosa Creek. In order to keep Hwy-101 traffic moving throughout construction of the project, the bridge will be constructed in stages. This construction staging will involve shifting traffic so that some of the existing bridge can be

demolished and a portion of the new bridge can be constructed. After completing each phase, traffic would be shifted again to newer portions of the bridge so that the remaining portions of the existing bridge can be demolished and the rest of the new bridge can be constructed.

Work associated with the proposed bridge replacement and habitat enhancement structures involves the diversion of streamflow by means of a temporary cofferdam. The diversion will be accomplished prior to any work within the stream channel. In order to divert water by gravity to downstream of the project area, Caltrans will construct a coffer dam at the upstream end of the project area. The coffer dam will have a large pipe built into it to convey water through the work area. The outfall end of the pipe will be placed within the active stream channel at the downstream end of the project area. The diversion pipe can be shifted to one side of the channel or the other within the project area, as needed to complete the work. All fish within the dewatering reach downstream of the coffer dam will be captured by seine and dip net and will be relocated to the creek beginning at the Olive Street Bridge.

The existing bridge is a cast-in-place reinforced concrete box girder structure in three parts. One part of the bridge carries two northbound traffic lanes on Hwy-101 and one exit ramp lane to 3rd Street. The second part of the bridge carries two southbound traffic lanes and the third carries southbound ramp traffic. All three parts of the bridge are supported by a pair of continuous reinforced concrete pier walls built parallel to the Santa Rosa Creek channel. The walls are approximately two feet wide and are supported on a three-foot wide footing (underground).

Removal of the existing bridge will utilize standard methods of bridge demolition to be determined during the Design Phase of the project. The method of demolition will conform to the conditions provided by the resource agencies with regard to windows of construction and protection of the water in the creek. Heavy equipment will be utilized within the creek channel for the demolition of the bridge. The creek channel will be accessed via the existing PMGP pathway on the north bank of the creek. The pier walls will be chipped down to about one foot below the finished grade and backfilled with earth, with the existing footings and pilings abandoned in-place.

The new bridge will be constructed essentially in the same location as the existing bridge, except it will be approximately 20 feet wider than the existing bridge on the east side. Since the Hwy-101 mainline will be widened in the median, the new bridge will not have a gap between the northbound and southbound directions. The new bridge will be a free span cast-in-place reinforced concrete box girder structure. This will involve falsework to support the structure while the concrete cures. Caltrans will work to construct falsework in such a way as to avoid any falsework in the water or within the creek bed. Construction of the new bridge will involve constructing larger abutments at each end of the bridge in order to support the new free span structure. The new abutments will be constructed at the same location as the existing abutments, or slightly further away from the creek. The exact distance from the creek has not yet been determined. The new abutments will be no closer to the creek than the existing abutments.

After the bridge is built, a pedestrian/bicycle path along the south bank of Santa Rosa Creek under the new bridge will be constructed. This will connect the existing segments that currently end at

either side of the State Right of Way. The new path will be constructed utilizing heavy equipment and will be designed similar to the existing path on the north bank. It will pass under the bridge with a retaining wall supporting the embankment on the abutment side. In addition to enhancing the PMGP, the new pedestrian/bicycle path is intended to replace an existing pedestrian overcrossing, just south of the Hwy-101 bridge over Santa Rosa Creek, which will be removed to accommodate the freeway widening.

In addition to the demolition and construction of the Hwy-101 bridge over Santa Rosa Creek, Caltrans also proposes to install several boulder weir habitat enhancement structures within Santa Rosa Creek. The reach between the Hwy-101 bridge and the A Street bridge was chosen because the reach is currently grouted with a uniform bottom and low channel sinuosity. Caltrans has identified the weir structures as the best proposed mitigation alternative for the bridge replacement project. Installation of the weirs will improve conditions for fish migration as well as minimize the potential detrimental effects to the banks by keeping the flow in the center of the channel.

The weirs would be installed in an upstream "V" shape with the apex of the "V" facing upstream and a chain of boulders trailing down toward each bank. This orientation will encourage flow to converge into the weir and maximize the opportunity for fish passage by creating eddies downstream of the boulders. These eddies provide lower velocity areas for fish to use when moving upstream. The upstream end of the weir provides a backwater to deepen and slow the velocity of water across the channel at low flows while not impeding the momentum of water at higher flows. The placement of the boulder weirs will be such that flow will be concentrated toward the center of the channel. The concentration of flow will create a scour area directly downstream of each weir followed by a gravel bar at the downstream end of the pool. A glide or run habitat will be created on the upstream side of each weir by concentrating flow and increasing the velocity at the center of each weir.

Although the conceptual design has been described above, design details will be developed during the engineering phase of the project. The engineering design and placement will consider the expected flow regimes, channel sinuosity and gradient, opportunity for fish passage, and aesthetics. The engineering design will begin once the proposed conceptual design is accepted by NOAA Fisheries, the City of Santa Rosa, the Sonoma County Water Agency, and Caltrans.

Below is a list of Best Management Practices that were developed to minimize impacts to steelhead and to salmonid habitat:

- Equipment staging/storage area will be outside of the creek bed and bank.
- A high visibility construction fence outlining the limits of work will be installed as a first order of work. No work, storage or other activities shall occur outside these limits. The area outside the fence will be considered as an Environmentally Sensitive Area.

- To minimize project impacts to sensitive fish species, the in-stream construction period will be limited to June 15 through October 31. All coffer dams, pipes, and construction materials/equipment will be removed from the creek corridor before October 31 with the

creek bed in ready condition for winter storm flows.

- A coffer dam and corrugated steel pipe will be installed on clean gravel and filter fabric. The cofferdam, filter fabric and corrugated steel pipe will be removed from the creek bed after completion of the project. Before either pipe or gravel is introduced into the creek filter fabric must be placed in the creek bed to catch any sediment and to help with the final removal of materials. The fabric must extend above and below impacted areas and should be held down with properly sealed and tied sandbags. These procedures are intended to avoid water pollution and avoid hindering stream flow.

- Caltrans will provide a qualified fisheries biologist approved by NOAA Fisheries to capture and transport any salmonids present within the project area. Salmonids will be released at a safe location downstream of the project site. The biologist will document the findings in a short report which will be submitted to NOAA Fisheries.

- The creek and creek banks will be restored to their original conditions before water diversion structures are removed at the end of each construction season.

- Once construction is finished for each construction season, all project introduced material (pipe, gravel, false work, filter fabric, demolition debris, etc.) must be removed, leaving the creek as it was before construction. Excess materials will be disposed of at an approved disposal site.

A. Description of the Action Area

The action area is defined as all areas affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For this project, the action area includes the bank to bank width of Santa Rosa Creek in the reach between Santa Rosa Avenue downstream to the Railroad bridge in downtown Santa Rosa (Figure 1). The action area also includes Paulin Creek. However, the proposed widening project will not involve any construction work in Paulin Creek, the footprint of the bridge will not extend further into the creek, and the bed and banks of the creek will not be disturbed. Therefore no adverse effects to steelhead or coho salmon critical habitat are expected in this creek and our analysis in this opinion focuses on Santa Rosa Creek.

Although direct impacts to steelhead are anticipated to be localized to the Santa Rosa Creek reach between the A Street bridge downstream to the Olive Street bridge, the action area has been extended both upstream and downstream due to the anticipated indirect effects of the project. The action area has been extended upstream to analyze any impacts that may occur if steelhead move upstream. The action area has been extended downstream due to the relocation of steelhead and to consider the potential for steelhead to move downstream after being relocated. Both situations could result in displacement and/or increased competition among listed fish and increased predation on listed fish.

III. STATUS OF THE SPECIES AND CRITICAL HABITAT

This biological opinion analyzes the effect of the proposed action on the following species and critical habitat:

- Threatened Central California Coast (CCC) steelhead (62 FR 43937; August 18, 1997).
- Designated critical habitat for Central California Coast (CCC) coho salmon (64 FR 24049; May 5, 1999).

The best available information on the distribution and abundance of CCC coho salmon indicate that they are not likely to rear or migrate through the action area, and thus are not likely to be present. Based on their life history, California Coastal (CC) Chinook salmon *(O. tshawytscha)* are also not likely to be present in the action area during the implementation of the project. Therefore, CCC coho salmon and CC Chinook salmon are not likely to be adversely affected by the proposed action and will not be further considered in this opinion.

A. Steelhead Life History and Biological Requirements

Steelhead spend from one to five years in saltwater, however, two to three years are most common (Busby *et al.* 1996). Some return as "half-pounders" that over-winter one season in freshwater before returning to the ocean in the spring. The distribution of steelhead in the ocean is not well known. Coded-wire tag recoveries indicate that most steelhead tend to migrate north and south along the continental shelf (Barnhart 1986).

The timing of upstream migration is correlated with higher flow events, such as freshets or sand bar breaches, and associated lower water temperatures. There are two types of steelhead, summer steelhead and winter steelhead. Summer steelhead return to freshwater during June through September, migrate inland toward spawning areas, overwinter in the larger rivers, and then resume migration to natal streams and spawn (Meehan and Bjornn 1991). Winter steelhead return to freshwater in autumn or winter, migrate to spawning areas, and then spawn in late winter or spring. Only winter steelhead are found in Santa Rosa Creek. Winter steelhead begin returning to Santa Rosa Creek in December, with the run continuing into April. Most spawning takes place from January through April. Steelhead may spawn more than once before dying (iteroparity), in contrast to other species of the *Oncorhynchus* genus.

Steelhead spawn in cool, clear streams featuring suitable water depth, gravel size, and current velocity. Intermittent streams may be used for spawning (Barnhart 1986; Everest 1973). The number of days required for steelhead eggs to hatch is inversely proportional to water temperature and varies from about 19 days at 15.6□C to about 80 days at 5.6□C. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart 1986).

Upon emerging from the gravel, fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Older fry establish territories which they defend. Juvenile salmonids occupy available low-velocity portions of the stream and areas with cover (Raleigh *et al.* 1984), including shallow water along stream banks (Barnhart 1986; Moyle 2002). Cover is an important habitat component for juvenile steelhead and smolts, both as velocity refuge and as a means of avoiding predation (Shirvell 1990; Meehan and Bjornn 1991; Moyle 2002). Steelhead juveniles will balance their use of cover and foraging habitats based on their competing needs for energy acquisition and safety (Bradford and Higgins 2001). Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. In winter, they become inactive and hide in any available cover, including gravel or woody debris.

Because rearing juvenile steelhead reside in freshwater all year, adequate flow and temperature are important to the population at all times (CDFG 1997). Generally, throughout their range in California, steelhead that are successful in surviving to adulthood spend at least two years in freshwater before emigrating downstream. Emigration appears to be more closely associated with size than age. In Waddell Creek, Shapovalov and Taft (1954) found steelhead juveniles migrating downstream at all times of the year with the largest numbers of age 0+ and yearling steelhead moving downstream during spring and summer. Smolts can range from 14-21 cm in length.

Water temperature influences the growth rate, population density, swimming ability, ability to capture and metabolize food, and ability to withstand disease of these rearing juveniles (Barnhart 1986; Bjornn and Reiser 1991). Rearing steelhead juveniles prefer water temperatures of 7.2-14.4□C and have an upper lethal limit of 23.9□C. They can survive up to 27□C with saturated dissolved oxygen conditions and a plentiful food supply. Fluctuating diurnal water temperatures also aid in survivability of salmonids (Busby *et al.* 1996).

During rearing, suspended and deposited fine sediments can directly affect salmonids by abrading and clogging gills, and indirectly cause reduced feeding, avoidance reactions, destruction of food supplies, reduced egg and alevin survival, and changed rearing habitat (Reiser and Bjornn 1979).

B. Status of Species and Critical Habitat

In this opinion, NOAA Fisheries assesses the status of species by examining four types of information, all of which help us understand a population's ability to survive. These population viability parameters are: abundance, population growth rate, spatial structure, and diversity (McElhaney *et al.* 2000).

Abundance is a measure of the population size and is generally expressed as the number of spawning adults or the number of rearing juveniles. Small populations are generally at greater risk of extinction because as their numbers vary in response to environmental changes, the population can dip to critically low numbers more easily than larger populations (Gilpin and Soule 1986; Pimm *et al.* 1988).

The growth rate of a population is a function of the species' intrinsic ability to reproduce and the capacity of their environment to support the population. Life stage specific survival rates and long-term trends in abundance are both indications of a population's performance in response to its environment. If a population is consistently failing to replace itself, as indicated by low survival rates and/or long-term population declines, then it is at an increased risk of extinction.

A population's spatial structure refers to the geographic distribution of individuals in the population. This structure depends in part on habitat quality and the species dispersal characteristics. Species range constriction and fragmentation are likely to interfere with the population structure and are indications of reduced viability.

Species diversity is manifested genotypically (genetic variation among individuals in a population) and phenotypically (morphological and behavioral variation among individuals in a population). These forms of diversity allow species to better survive the challenges of environmental variations. A diverse population is more likely to contain combinations of traits that prove successful in coping with a given environment. Conversely, a lack of diversity, as happens when populations are diminished, decreases the species likelihood of surviving environmental adversity.

While there is insufficient information to evaluate these population viability parameters in a quantitative sense, NOAA Fisheries has used existing information to determine the general condition of each population.

1. Steelhead

a. Abundance

Steelhead abundance in the CCC ESU is low. Stream water temperature increases and other habitat alterations over large areas in the ESU have led to shifts in fish communities favoring warm water species. Steelhead north of the Russian River are still fairly abundant. However, streams impacted by urban development, typically support few, if any, steelhead. Nonetheless,

this species remains more common than Chinook and coho salmon in Northern California. While there are no specific estimates of abundance at the population scale, steelhead numbers are substantially reduced from historical levels as described below. A total of 94,000 adult steelhead were estimated to spawn in the rivers of this ESU in the mid-1960s, including 50,000 fish in the Russian River and 19,000 fish in the San Lorenzo River (Busby *et al.* 1996). Recent estimates for the Russian River are on the order of 4,000 fish (NOAA Fisheries 1997). Abundance estimates for smaller coastal streams in the ESU indicate low but stable levels (NOAA Fisheries 1997), with recent estimates for several streams (Lagunitas Creek, Waddell Creek, Scott Creek, San Vincente Creek, Soquel Creek, and Aptos Creek) of individual run sizes of 500 fish or less (62 FR 43937).

b. Population Growth Rate

The Russian River, which is the largest watershed in the ESU, once boasted steelhead runs ranked as the third largest in California behind only the Klamath and Sacramento rivers. Although it is not possible to distinguish the relative proportions of hatchery and natural steelhead, more recent estimates indicate an average abundance of 4,000 fish in the Russian River and between 150 and 305 fish in the San Lorenzo River (Busby *et al.*1996; NOAA Fisheries 1997). Although it is difficult to assess the sustainability of natural populations in these two major river basins because of substantial hatchery programs and a general lack of information about naturally spawning hatchery fish, these estimates suggest that recent total abundance of naturally reproducing steelhead in these two rivers is less than 10 percent of their abundance in the mid 1960s. Overall, the abundance of the CCC steelhead ESU has declined precipitously, from an estimated 94,000 returning adults in the 1960s to estimates between less than 5,350 in recent times (Busby *et al.*1996; NOAA Fisheries 1997). These numbers represent over a 94 percent decline in the population of steelhead spawning in the ESU. It is reasonable to assume therefore, that the population growth rate is negative.

NOAA Fisheries (2003) evaluated five independent data sets to estimated population trends of juvenile CCC steelhead; there were no recent estimates of adult steelhead abundance. Results suggests an overall decline in juvenile abundance in all five populations. However, the data have limited usefulness for understanding the status of the adult population, because there is no simple relationship between juvenile numbers and adult numbers (Shea and Mangel 2001). For more detailed information on the status of CCC steelhead, see: Busby *et al.* 1996; NOAA Fisheries 1997; and NOAA Fisheries 2003.

c. Spatial Structure

CCC steelhead have maintained a wide distribution throughout the ESU. Presence/absence data show that in a subset of streams sampled in the Central California Coast region, most contain steelhead (NOAA Fisheries 1997). Of streams in the ESU for which there is current presence/absence data on steelhead, 218 of 264 streams currently support some juveniles (including the Russian River). Many streams in and around the San Francisco Bay region, however, no longer support steelhead. At least one watershed in the ESU, Stemple Creek, has no

urban development and no steelhead. This may be due to a lack of suitable spawning substrate and extensive habitat degradation associated with dairy farming.

The species relatively broad distribution throughout the ESU is a positive indicator (62 FR 43937). Species with broad distributions are more likely to survive environmental fluctuations and stochastic events, even if they suffer local extirpation (Pimm *et al.* 1988).

d. Diversity

The interbasin transfer of hatchery steelhead has persisted in various locations and at various times within the CCC ESU (NOAA Fisheries 1997). This has undoubtedly affected the genetic composition of existing stocks. Although some genetic research is being done on CCC steelhead, little information is available to assess the diversity of the species.

e. Conclusions

While CCC steelhead have experienced significant declines in abundance, and long-term population trends suggest a negative growth rate, they have maintained a wide distribution throughout the ESU. This suggests that, while there are significant threats to the population, they possess a resilience that is likely to slow their decline. In the recent document titled *Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead*, the biological review team concluded that steelhead in the CCC steelhead ESU remain likely to become endangered in the foreseeable future (NOAA Fisheries 2003).

2. Coho Salmon Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Endangered Species Act (ESA) as "(I) the specific areas within the geographical area occupied by the species . . . on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species . . . upon a determination by the Secretary of Commerce (Secretary) that such areas are essential for the conservation of the species" (see 16 U.S.C. 1532(5)(A)). The term 'conservation', as defined in section 3(3) of the ESA, means ". . . to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary" (see 16 U.S.C. 1532(3)). Therefore, critical habitat is the geographic area and habitat functions necessary for the recovery of the species.

The condition of CCC coho salmon critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NOAA Fisheries has determined that present depressed population conditions are, in part, the

result of the following human induced factors affecting critical habitat[1]: logging, agricultural and mining activities, urbanization, stream channelization, dams, wetland loss, and water withdrawals and unscreened diversions for irrigation.

Numerous studies have demonstrated that land use activities associated with logging, road construction, urban development, mining, agriculture, and recreation have significantly degraded coho salmon critical habitat quantity and quality in the CCC ESU. Impacts of concern include alteration of stream bank and channel morphology, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels and large woody debris, degradation of water quality, removal of riparian vegetation resulting in increased stream bank erosion, increases in erosion entry to streams from upland areas, loss of shade (higher water temperatures) and loss of nutrient inputs (Botkin *et al.* 1995; NOAA Fisheries 1996; 61 FR 56138).

Depletion and storage of natural river and stream flows have drastically altered natural hydrologic cycles in many of the streams in the ESU. Alteration of flows results in migration delays, loss of suitable habitat due to dewatering and blockage; stranding of fish from rapid flow fluctuations; entrainment of juveniles into poorly screened or unscreened diversions, and increased water temperatures harmful to salmonids (61 FR 56138).

a. Critical Habitat Trend

In listing this species as threatened under the ESA, and designating its critical habitat, NOAA Fisheries determined that few, if any, State regulatory programs qualify under section 4(d) of the ESA as conserving listed species. Thus, NOAA Fisheries judges the State regulatory mechanisms currently in place as inadequate to prevent continued habitat degradation from urbanization, water use, logging, agriculture, road construction, mining, and recreation.

With the listing of CCC coho salmon and the designation of critical habitat, the provisions of the federal ESA took effect to prevent Federal actions from authorizing, funding, or carrying out actions that would jeopardize the long-term survival and recovery of the species and/or taking actions that would adversely modify critical habitat. In addition, both the State and Federal government are providing funding for habitat restoration projects in this, and other, ESUs. However, Federal agency actions affect only a subset of many of the critical habitat areas and/or elements. Funding for restoration has been increased since the late 1990s, but it may not affect a significant portion of degraded critical habitat for several decades. Thus, it is unknown whether State management of land use, Federal agency responsibilities under the ESA, and State/Federal restoration efforts are likely to reverse the overall trend of continued habitat degradation in the CCC coho salmon ESU in the near future.

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[1]Other factors, such as over fishing and artificial propagation have also contributed to the current population status of these species. All these human induced factors have exacerbated the adverse effects of natural environmental variability from such factors as drought and poor ocean conditions.

3. Factors Affecting the Species and Critical Habitat

Threats to naturally reproducing salmon and steelhead are numerous and varied. Among the most serious and ongoing threats to the survival of this ESU are changes to natural hydrology, and habitat degradation and loss. The following discussion provides an overview of the types of activities and conditions that adversely affect salmon and steelhead ESUs in California watersheds.

a. Habitat Degradation and Destruction

A major cause of the decline of salmon and steelhead is the loss or severe decrease in quality and function of essential freshwater habitat. Most of this habitat loss and degradation has resulted from anthropogenic watershed disturbances caused by agriculture, logging, urban development, water diversion, road construction, erosion and flood control, dam building, and grazing. Most of this habitat degradation is associated with the loss of essential habitat components necessary for salmon and steelhead survival. For example, the loss of deep pool habitat as a result of sedimentation and stream flow reductions has reduced rearing and holding habitat for juvenile and adult salmonids.

b. Natural Stochastic Events

Natural events such as droughts, landslides, floods, and other catastrophes have adversely affected salmon and steelhead populations throughout their evolutionary history. The effects of these events are now oftentimes exacerbated by anthropogenic changes to watersheds such as logging, road building, and water diversion. The ability of species to rebound from natural stochastic events is now likely limited as a result of these and other existing anthropogenic factors or depressed populations.

Variability in ocean productivity has been shown to affect salmon production both positively and negatively. Beamish and Bouillion (1993) showed a strong correlation between North Pacific salmon production from 1925 to 1989 and their marine environment. Beamish *et al.* (1997) noted decadal-scale changes in the production of Fraser River sockeye salmon that they attributed to changes in the productivity of the marine environment. Johnson (1988) noted increased adult mortality and decreased average size for Oregon's Chinook and coho salmon during the strong 1982-83 El Niño. It is unclear to what extent ocean conditions have played a role in the decline of salmon and steelhead; however, ocean conditions have likely affected populations throughout their evolutionary history.

c. Flows

Depletion and storage of natural flows have drastically altered natural hydrological cycles in many central California rivers and streams. Alteration of streamflows has increased juvenile salmonid mortality for a variety of reasons: migration delay resulting from insufficient flows or habitat blockages; loss of usable habitat due to dewatering and blockage; stranding of fish resulting from rapid flow fluctuations; entrainment of juveniles into unscreened or poorly screened diversions; and increased juvenile mortality resulting from increased water temperatures (Berggren and Filardo 1993; Chapman and Bjornn 1969; 61 FR 56138).

d. Harvest

There are few good historical accounts of the abundance of salmon and steelhead harvested along the California coast (Jensen and Startzell 1967). Early records did not contain quantitative data by species until the early 1950's. In addition, the confounding effects of habitat deterioration, drought, and poor ocean conditions on salmon and steelhead survival make it difficult to assess the degree to which recreational and commercial harvest have contributed to the overall decline of salmonids in West Coast rivers.

e. Artificial Propagation

Releasing large numbers of hatchery fish can pose a threat to wild salmon and steelhead stocks through genetic impacts, competition for food and other resources, predation of hatchery fish on wild fish, and increased fishing pressure on wild stocks as a result of hatchery production (Waples 1991). The genetic impacts of artificial propagation programs are primarily caused by the straying of hatchery fish and the subsequent hybridization of hatchery and wild fish. Artificial propagation threatens the genetic integrity, and diversity that protects overall productivity against changes in environment (61 FR 56138). The potential adverse impacts of artificial propagation programs are well documented (reviewed in Waples 1991; National Research Council 1995; National Research Council 1996; Waples 1999).

f. Marine Mammal Predation

Marine mammal predation is not believed to be a major factor contributing to the decline of West Coast salmon and steelhead populations relative to the effects of fishing, habitat degradation, and hatchery practices. However, marine mammal predation may significantly influence salmonid abundance in some local populations when other marine mammal prey are absent and physical conditions lead to the concentration of adult and juvenile salmonids (NOAA Fisheries 1999). At the mouth of the Russian River, Hanson (1993) reported that the foraging behavior of California sea lions and harbor seals with respect to anadromous salmonids was minimal. Hanson (1993) also stated that predation on salmonids appeared to be coincidental with the salmonid migrations rather than dependent upon them.

g. Reduced Marine-Derived Nutrient Transport

Reduced marine-derived nutrient (MDN) transport to watersheds is another consequence of the past century of decline in salmon abundance (Gresh *et al.* 2000). Salmon may play a critical role in the survival of their own species in that MDN (from salmon carcasses) has been shown to be vital for the growth of juvenile salmonids (Bilby *et al.* 1996; Bilby *et al.* 1998). The return of salmon to rivers makes a significant contribution to the flora and fauna of both terrestrial and riverine ecosystems (Gresh *et al.* 2000). Evidence of the role of MDN and energy in ecosystems infers this deficit may indicate an ecosystem failure that has contributed to the downward spiral of salmonid abundance (Bilby *et al.*1996).

IV. ENVIRONMENTAL BASELINE

The action area is located within the PMGP reach of Santa Rosa Creek in downtown Santa Rosa, Sonoma County, California. Santa Rosa Creek is located in the southeastern portion of the Russian River Basin (Figure 1) and is a tributary to the Laguna de Santa Rosa which is a tributary to Mark West Creek which is a tributary to the Russian River. The Santa Rosa Creek watershed is approximately 77 square miles with elevations that range from 59 feet at the mouth of the creek to 2,100 feet in the headwaters (CDFG 2001).

The action area is on the upstream end of the seven mile lower reach of Santa Rosa Creek that has been channelized and maintained for flood control. In the 1950s and 1960s, this area of Santa Rosa Creek was channelized as part of a small watershed flood control project sponsored by the Soil Conservation Service and implemented by the Sonoma County Water Agency (Golden Bear Biostudies 1999). In and effort to enhance the existing channel and to improve the aesthetic value of the creek corridor, the City of Santa Rosa recently implemented the PMGP. The action area is located within the PMGP reach of Santa Rosa Creek. As a result of the PMGP, the grouted cement channel at the downstream end of the action area has been removed in an effort to improve fish habitat. It now consists of fine gravel and sand. The channel in the upstream end of the action area still consists of grouted cement rip-rap.

Just upstream of the action area at Santa Rosa Avenue, Santa Rosa Creek goes underground through a concrete trapezoidal tunnel that provides fish passage. The confluence with one of Santa Rosa Creeks' major tributaries is also located underground in the concrete tunnel, but does not provide fish passage. The underground Santa Rosa Creek tunnel ends at E Street. From there, Santa Rosa Creek continues through the city of Santa Rosa and then goes through oak-woodland up to mixed conifer in the upper watershed.

Although large portions of the Santa Rosa Creek watershed are owned by the City of Santa Rosa and Sonoma County Regional Parks, the remaining areas are primarily owned by private landowners. The primary land use in the watershed is urban development, although vineyard development and livestock grazing also occurs.

A. Status of Listed Species/Critical Habitat in the Action Area

Steelhead abundance and trends within the action area are dependent upon multiple factors that affect steelhead populations within the Santa Rosa Creek watershed. Extensive habitat degradation and decreased carrying capacity has occurred as a result of urbanization, stream channelization, wetland loss, water withdrawals, agriculture and wastewater discharges. These activities have altered streambank and channel morphology, stream temperatures, spawning and rearing habitats, connectivity of habitats, and recruitment of large organic debris and spawning gravels. Within the action area, Santa Rosa Creek is a trapezoidal concrete and rip-rap channel that lacks complexity. In an effort to improve instream fish habitat, the City of Santa Rosa PMGP removed the concrete and rip-rap in the downstream portion of the action area as noted above.

2. Steelhead

Reproduction of the Santa Rosa Creek steelhead population is primarily dependent on spawning upstream of the action area. The action area primarily provides a migratory function for steelhead, however, small numbers of rearing steelhead have been documented within the action area during summer months. Degraded rearing habitat and low densities within the action area suggest that it is not currently an important habitat component for steelhead in the basin. The action area may be more important to outmigrating smolts with respect to its value as springtime rearing and velocity refuge.

While the steelhead population has declined in Santa Rosa Creek over the past several decades, its current numbers, distribution, and diverse use of habitat will likely provide resistance to environmental and anthropogenic perturbation. However, no information exists that demonstrates that the decline in the steelhead population has stabilized.

B. Salmonid Habitat/Critical Habitat Within the Action Area

The creek channel and riparian habitat within the action area have been degraded by the effects of urbanization. Salmonid habitat considerations within the action area are primarily related to water quality and quantity, and access to important spawning and rearing areas. Instream salmonid habitat conditions within the action area are generally poor. The action area does not contain adequate substrate for spawning. Overwinter and outmigration habitat conditions are also poor because the channel lacks habitat complexity and velocity refuge. Rearing habitat within the action area is marginal; primarily due to lack of complexity, elevated stream temperatures and management for flood control.

As noted previously, the action area is within the recently completed PMGP. The goal of the PMGP was to enhance salmonid habitat and water quality in Santa Rosa Creek while maintaining the flood carrying capabilities of the channel (Golden Bear Biostudies 1999). Although riparian trees were planted as part of the PMGP, the density of planted trees throughout the site is sparse and most of them were not planted close enough to the water to provide shade (Prunuske

Chatham, Inc. 2002). The PMGP somewhat improved summer rearing conditions, and as more riparian vegetation is established over the years, it is expected to benefit rearing habitat. However, the channel is maintained for flood control, so habitat conditions are anticipated to improve only slightly over time as a result of the PMGP.

C. Factors Affecting Species Environment Within the Action Area

The primary factor that has played a role in the decline of steelhead within the action area is human population growth and the resulting urbanization. The action area has been heavily impacted by human population growth and urbanization within the city of Santa Rosa. Human population growth, with its attendant increased demand for resources may be the "most clear and present danger" to native fishes in California (Thelander 1994). As the human population expands, demand for water and other resources increases proportionately, resulting in altered stream channels and degraded habitat, either directly or through cumulative negative impacts to the system (SEC 1996). As for pollution, SEC (1996) cited Florsheim and Goodwin (1993) who determined that stream pollution increased with higher human density, degrading water quality for both people and wildlife.

SEC (1996) also cited Botkin *et al.* (1995) who determined that urbanization had degraded salmon habitat through stream channelization, flood plain drainage, and damage to riparian vegetation. SEC (1996) cited Florsheim and Goodwin (1993) who found that as urban centers develop, there was an initial influx of sediment into streams from erosion, followed by an increase in runoff from the large areas of concrete and asphalt once building is complete, thus resulting in increasing flooding and stream bank erosion. They found that the frequent response was stream channelization, particularly on tributaries. Pressure on the fisheries increased as human population expanded in Sonoma County (SEC 1996).

V. EFFECTS OF THE PROPOSED ACTION

The purpose of this section is to identify the direct and indirect effects of the proposed action on threatened CCC steelhead, and on designated critical habitat for CCC coho salmon. Data to quantitatively determine the precise effects of the proposed action on steelhead, and to coho salmon critical habitat, are limited or not available; the assessment of effects therefore focuses mostly on qualitative identification. This approach was based on a review of ecological literature concerning the effects of loss and alteration of habitat elements important to salmonids, including water, substrate, food, and adjacent riparian areas; the primary constituent elements of proposed critical habitat that will be affected. This information was then compared to the likely effects associated with the proposed project.

The project is anticipated to take three consecutive construction seasons to complete, beginning in 2005. Construction activities within the creek channel will be limited annually to June 15 through October 31. The work window begin date of June 15 will avoid effects to steelhead

smolts since outmigration occurs prior to June 15. The work window end date of October 31 will avoid the immigration period for adult steelhead. Based on available data, NOAA Fisheries anticipates that a small number of juvenile steelhead will be within the action area during project implementation.

A. Dewatering

Prior to any work within the creek channel, a coffer dam will be built in order to dewater the construction area and to convey water in a pipe through and to downstream of the construction area. Changes in flow are anticipated to occur within area to be dewatered and downstream of the pipe outfall. These fluctuations in flow are anticipated to be small, gradual, and short-term which should not result in any harm to salmonids. Except for moving the creek into the diversion pipe, streamflow should not be affected as water will not be impounded and flows will be maintained downstream. Streamflow in the vicinity of the project should be the same as free-flowing conditions except for the footprint where streamflow is bypassed.

Stream flow diversion and work space dewatering is expected to cause temporary loss, alteration, and reduction of aquatic habitat within the action area. Stream flow diversions could harm individual steelhead by concentrating or stranding them in residual wetted areas (Cushman 1985) before they are relocated, or causing them to move to adjacent habitats (Clothier 1953; Clothier 1954; Kraft 1972; Campbell and Scott 1984). Steelhead could be killed or injured if crushed beneath the coffer dam during installation, though direct mortality is expected to be minimal because of the small number of steelhead in the action area and due to relocation efforts prior to installation of the diversion. During installation of the coffer dam, a fisheries biologist will remain in the creek to net and rescue any additional fish that may have become stranded throughout the dewatering process.

Steelhead which avoid capture in work area will die during dewatering activities. NOAA Fisheries expects that the number of steelhead that will be killed as a result of stranding during dewatering activities is very low. This is due to the small area affected, the relocation efforts and the low numbers of steelhead expected to be present within the action area. NOAA Fisheries expects that the juvenile steelhead stranding rate associated with dewatering for this project will be less than the unintentional mortality rate from capturing and handling procedures (three percent).

Benthic (*i.e.*, bottom dwelling) aquatic macroinvertebrates may be temporarily lost or their abundance reduced when individual organisms are stranded or when creek habitats are dewatered (Cushman 1985). Effects to aquatic macroinvertebrates resulting from stream flow diversions and dewatering will be temporary because construction activities will be relatively short-lived, and rapid recolonization (about one to two months) of disturbed areas by macroinvertebrates (Cushman 1985, Thomas 1985, Harvey 1986) is expected following rewatering. In addition, the effect of macroinvertebrate loss on juvenile steelhead is likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered areas since stream

flows will be maintained outside of the coffer dam. Based on the foregoing, the loss of aquatic macroinvertebrates as a result of dewatering activities is not expected to adversely effect steelhead.

Increased turbidity is anticipated to occur during the construction of the coffer dam and dewatering. Research with salmonids has shown that high turbidity concentrations can: reduce feeding efficiency, decrease food availability, reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases and can also cause fish mortality (Berg and Northcote 1985; Gregory and Northcote 1993; Velagic 1995; Waters 1995). Mortality of very young coho salmon and steelhead fry due to increased turbidity has been reported by Sigler *et al.* (1984). Even small pulses of turbid water will cause salmonids to disperse from established territories (Waters 1995), which can displace fish into less suitable habitat and/or increase competition and predation decreasing chances of survival.

Based on the effects described above, it is anticipated that rearing juvenile steelhead downstream of the area may be affected by short-term increases in turbidity caused during the construction of the coffer dam and dewatering. These pulses of turbidity may cause fish to move downstream to avoid the turbidity. Pulses of increased turbidity are not anticipated to reach lethal levels. However, pulses of increased turbidity may result in juvenile steelhead temporarily vacating preferred habitat areas and/or temporarily reducing their feeding efficiency. Due to the timing of the project and poor salmonid habitat within the action area, only low numbers of juvenile steelhead are anticipated to be affected and the minimal nature of the turbidity levels are not expected to have a detectable impact on the survival of individual fish.

B. Fish Relocation

Fish relocation activities are proposed to relocate steelhead out of the reach of creek that will be dewatered. Fish relocation activities pose risk of injury or mortality of juvenile steelhead. Any fish collecting gear, whether passive (Hubert 1983) or active (Hayes 1983) has some associated risk to the fish, including stress, disease transmission, injury, or death. Fish in the project area will be captured for relocation using a seine and dip net. The amount of unintentional injury and mortality attributable to the fish relocation efforts vary depending on the seine used, the ambient conditions, and the expertise and experience of the field crew. Based on reporting from research permits and other relocation efforts, NOAA Fisheries estimates the rate of unintentional mortality and injury at three percent, as noted above.

Relocated fish may also endure stress from crowding at the relocation sites and increased competition for available resources such as food and habitat. This may reduce the survival chances of some fish at the relocation sites. Some of the fish at the relocation sites may choose not to remain in these areas and may move either upstream or downstream to areas that have more habitat and less density of fish. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. NOAA Fisheries cannot accurately estimate the number of fish adversely affected by competition, but does not believe this impact will cascade

through the Santa Rosa Creek watershed population of steelhead based on the small area that will likely be affected. Despite these impacts, fish relocation efforts are expected to minimize project impacts to steelhead by removing them from areas where they would have experienced high rates of injury and mortality.

C. Toxic Chemicals

Heavy construction equipment will be utilized within the dewatered creek channel during the demolition of the old bridge, construction of the new bridge, and installation of the habitat enhancement structures. Oils and similar substances from construction equipment can contain a wide variety of hydrocarbons, some of which evaporate rapidly while others sorb to sediments and may persist for long periods of time. These polynuclear aromatic hydrocarbons (PAHs) can prove harmful to benthic communities (EPA 1993) which are a salmonid food source. Fluid leaking from construction equipment can also contain metals, which do not degrade in the environment. Some metals (e.g., mercury, cadmium, lead, chromium) bioaccumulate in aquatic organisms inhabiting metals contaminated environments. Some of the sub-lethal effects that metals can cause in salmonids include: immobilization and impaired locomotion, reduced growth, reduced reproduction, and impairment of olfactory and brain functions (Eisler 2000).

Fluid leakage can occur during operation, refueling and during maintenance activities. There is a potential for leakage of toxic chemicals to occur during the project that may have the potential to affect salmonids. In order to minimize the potential adverse affects associated with using heavy equipment, heavy equipment will be operated primarily within the dewatered reach of the creek. NOAA Fisheries anticipates that if there is a leak, it can be contained and cleaned up prior to entering the flowing water, making it unlikely that salmonids will be adversely affected.

In addition to toxic chemicals associated with the heavy equipment, water that comes into contact with wet cement during construction of the new bridge can also adversely affect water quality and steelhead downstream of the work area. Water that comes in contact with wet cement can result an imbalance in pH. Many authors have reported that an inbalance in pH can cause as much as 75 percent mortality of salmonids (Thut and Schmiege 1991). Although the work area will be dewatered, there is the potential that water quality and steelhead could be adversely affected if the water that comes into contact with the wet cement is released into the creek downstream of the dewatered area.

D. Boulder Weir Habitat Enhancement Structures

The purpose of the proposed habitat enhancement structures is to provide benefits to steelhead and salmonid habitat. The orientation of the "V" is intended to encourage flow to converge into the weir and maximize the opportunity for fish passage by creating eddies downstream of the boulders. These eddies provide lower velocity areas for fish to use when moving upstream. The structures are also intended to provide benefits to overwintering juvenile steelhead by providing cover and low velocity refuge areas during storm events. These benefits of the boulder weir

habitat enhancement structures can only be realized if the structures are appropriately designed and placed within the channel. Therefore, take may occur if fish habitat enhancement structures impede fish passage due to inadequate design or operation. With proper project design, NOAA Fisheries expects the boulder weir structures will improve salmonid rearing habitat in the action area.

E. Other Indirect Effects

The proposed widening of Hwy-101 is a response to increased urban growth in the North Bay Area, with the stated purpose of improving the overall travel delay time that is currently experienced and may be experienced in the future between State Route 116 in Cotati and River Road in Fulton during busy AM and PM peak traffic periods. While the widening of this portion of Hwy-101 might have an impact on the urban growth rate in Santa Rosa in the future, urban growth is driving the actions of FHWA and Caltrans to widen the freeway, and any impact the action under consultation has on that growth rate is therefore likely to be very small and cannot be reliably estimated. NOAA Fisheries does not expect any adverse impacts to steelhead or coho salmon critical habitat from any change to the growth rate in Santa Rosa that might occur due to this proposed project.

VI. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. NOAA Fisheries is not aware of any additional actions that would cause cumulative effects beyond those that are ongoing, including urban development, and have been analyzed in the *Environmental Baseline* section of this biological opinion.

VII. INTEGRATION AND SYNTHESIS OF EFFECTS

As with other salmonid species, steelhead populations have declined significantly. There is fragmentation in their distribution associated with the intense urbanization pressures in and around the San Francisco bay area. However, the CCC steelhead have maintained higher numbers relative to other salmonids, and continues to utilize a wider range of habitat conditions. Their populations in coastal watersheds are widespread and fairly abundant. These conditions suggest that the CCC steelhead population likely maintains a resilience to perturbation.

Habitat conditions within the action area are generally poor. Rearing habitat within the action area is marginal; primarily due to lack of complexity, elevated stream temperatures and management for flood control. Overwinter and outmigration habitat conditions are also poor

because the channel lacks habitat complexity and velocity refuge. The boulder weir structures are expected to improve rearing habitat.

CCC steelhead are present in the action area in very low numbers. The action area provides marginal rearing habitat in the mainstem, so there are few juveniles present. Overall, this area does not significantly contribute to the CCC steelhead population.

The best management practices contained within the proposed action minimizes risks to CCC steelhead. Short-term impacts from project activities will be minimal and localized at the site. However, many of steelhead present in the work area will be subject to disturbance, capture, relocation, and related stresses during three consecutive summers. A small number of these steelhead may be injured or killed. Only a small percentage of the steelhead population within Santa Rosa Creek watershed will be temporarily affected as a result of this project and this part of the rearing population is unlikely to provide an important contribution to the Santa Rosa Creek population's numbers. Spawning habitat will not be adversely impacted by the proposed project, and a small portion of the Creek's rearing habitat is likely to be improved. Rearing juveniles in areas of better habitat conditions in Santa Rosa Creek will compensate for any losses to juveniles that occur in the action area due to project construction because juveniles rearing elsewhere in Santa Rosa Creek are more numerous, widely distributed, and are located in habitat conditions which give them a much greater chance of survival to smolt age. In addition, improvements to rearing habitat in the action area are expected to improve the survival chances of the small number of steelhead that use this portion of Santa Rosa Creek. Therefore, the effects of the project are not likely to appreciably reduce the numbers, distribution or reproduction of CCC steelhead in the Santa Rosa Creek watershed or the CCC steelhead ESU; and are not likely to diminish the value of designated critical habitat.

VIII. CONCLUSION

After reviewing the best available scientific and commercial information, the current status of Central California Coast steelhead, the environmental baseline for the action area, the effects of the proposed widening of HWY-101 over Santa Rosa Creek and the installation of fish habitat enhancement structures within Santa Rosa Creek and the cumulative effects, it is NOAA Fisheries' biological opinion that the proposed project is not likely to jeopardize the continued existence of Central California Coast steelhead, and is not likely to destroy or adversely modify designated Central California Coast coho salmon critical habitat.

IX. INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NOAA Fisheries as an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the FHWA so that they become binding conditions of any grant or permit issued to Caltrans, as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to assume and implement the terms and conditions or (2) fails to require Caltrans to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA or Caltrans must report the progress of the action and its impact on the species to NOAA Fisheries as specified in the incidental take statement (50 CFR §402.14(i)(3)).

A. Amount or Extent of Take

The widening of Hwy-101 over Santa Rosa Creek and the installation of fish habitat enhancement structures within Santa Rosa Creek is expected to result in minimal incidental take of threatened Central California Coast steelhead. Fish in the vicinity of the project could be disturbed by the project construction activities. Some juvenile steelhead could be adversely affected when Santa Rosa Creek is diverted and dewatered for construction activities. Juvenile steelhead that are displaced due to the diversion may suffer an increase risk of competition and predation.

The number of steelhead that may be incidentally taken during project activities cannot be accurately quantified due to (1) the unknown number of fish that may be present; (2) the unknown number of fish that may be stranded; (3) the level of harm or mortality that might occur when juvenile fish are displaced to other habitat areas of the stream; and (4) the level of harassment, harm, or mortality resulting from accidental releases of contaminants. In instances where NOAA Fisheries can not quantify the amount of incidental take, surrogates such as the extent of habitat affected or modified by the proposed action are used.

Therefore, take is quantified as: All fish present in the action area between June 15 and October 31 (during the years that the project occurs) may be captured and/or harassed by relocation activities. No more than three percent of juvenile salmonids captured during relocation efforts are anticipated to be killed. NOAA Fisheries expects that the number of steelhead that will be killed as a result of stranding during dewatering activities is very low. This is due to the small area affected, the relocation efforts and the low numbers of steelhead expected to be present within the action area. In addition, take may occur if fish habitat enhancement structures impede fish passage due to inadequate design or operation.

B. Effect of the Take

In the accompanying biological opinion, NOAA Fisheries determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

C. Reasonable and Prudent Measures

At the interagency field review and in subsequent communications, potential impacts were identified and measures were developed to ensure the project was constructed in the manner with minimized impacts to the environment. Best management practices proposed as part of the project action were developed as a result of this interagency cooperation. The measures were deemed necessary to minimize the effects and incidental take of threatened Central California Coast steelhead that will result from project activities. The measures are outlined in the Description of the Proposed Action section in this biological opinion, and are not repeated here.

Pursuant to section 7(b)(4) of the ESA, the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of threatened Central California Coast steelhead:

1. Measures shall be taken to reduce injury or harm to steelhead.

2. Measures shall be taken to assure that adverse effects to water quality are minimized.

3. Measures shall be taken to ensure that the boulder weir habitat enhancement structures are adequately designed and placed within the channel to avoid impeding salmonid passage.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA and their designee(s) must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. The FHWA is responsible for Caltran's compliance with the following terms and conditions that implement the reasonable and

prudent measure.

1. The following terms and conditions implement Reasonable and Prudent Measure 1, which states that measures shall be taken to reduce injury or harm to steelhead.

   a. The FHWA or Caltrans must notify the NOAA Fisheries Santa Rosa Area Office, by letter stating the project commencement date, at least fourteen days prior to implementation at:

      National Marine Fisheries Service
      Santa Rosa Area Office Supervisor
      Protected Resources Division
      777 Sonoma Avenue, Room 325
      Santa Rosa, California 95404

   b. Block nets shall be set up at the upstream and downstream extent of each habitat unit to prevent immigration and emigration of salmonids during relocation and construction activities.

   c. Seining must be conducted by experienced biologists. After seining, the biologist should monitor habitat areas and check for fish that were not captured during initial seining efforts, and repeat efforts if necessary.

   d. Captured salmonids will be relocated, as soon as possible, to a suitable instream location downstream of the work area.

   e. If any listed salmonids are found dead or injured, the project permittee shall contact NOAA Fisheries' Fishery Biologist Jeffrey Jahn by phone immediately at (707) 575-6097. If Jeffrey Jahn cannot be reached, the Santa Rosa NOAA Fisheries Office shall be contacted at (707) 575-6050. The purpose of the contact is to review the activities resulting in take and to determine if additional protective measures are required. All steelhead mortalities must be retained, placed in an appropriately sized whirl pack or zip-lock bag, labeled with the date of collection, fork length, location of capture, and be frozen as soon as possible. Frozen samples must be retained until specific instructions are provided by NOAA Fisheries.

   f. In order to monitor the impact of incidental take, FHWA or Caltrans must notify the NOAA Fisheries Santa Rosa Office by letter within 30 days after project completion detailing any incidental take that occurred during the project. This shall include the species taken, date taken, type of take (capture and relocate, injury, mortality), number taken, and fork length of any mortalities. This should be sent to:

      National Marine Fisheries Service
      Santa Rosa Area Office Supervisor

Protected Resources Division
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404

1. The following terms and conditions implement Reasonable and Prudent Measure 2, which states that measures shall be taken to assure that effects to water quality are minimized.

   a. All equipment refueling and maintenance will occur outside the river channel (top of bank to top of bank).

   b. Construction equipment used within the creek channel will be checked each day prior to work within the creek channel (top of bank to top of bank) and if necessary action will be taken to prevent fluid leaks. If leaks occur during work in the channel (top of bank to top of bank), Caltrans will contain the spill and remove the affected soils.

   c. Water that comes in contact with wet concrete and has a pH greater than 9.0 must not be allowed to enter the ground or stream but shall be either: 1) pumped to a separate, lined basin, and then pumped to a truck or upland for disposal or treatment (not within the bank to bank of any waterway); or 2) pumped directly to a truck for disposal at a site that is not within the top of bank to top of bank of any waterway.

3. The following terms and conditions implement Reasonable and Prudent Measure 3, which states that measures shall be taken to ensure that the boulder weir habitat enhancement structures are adequately designed and placed within the channel in order to ensure that salmonid passage is not impeded.

   a. FHWA or Caltrans shall submit the final engineering design for the boulder weir habitat enhancement structures to NOAA Fisheries for evaluation and approval prior to implementation. This should be sent to:

      National Marine Fisheries Service
      Santa Rosa Area Office Supervisor
      Protected Resources Division
      777 Sonoma Avenue, Room 325
      Santa Rosa, California 95404

This incidental take statement is based on full implementation of the proposed widening of HWY-101 over Santa Rosa Creek and the installation of fish habitat enhancement structures within Santa Rosa Creek as described in the April 2003 Biological Assessment and subsequent documents, and as described in the Description of the Proposed Action section of this biological opinion, including best management practices that were incorporated into the project design.

Failure to implement the project as proposed (including all relevant measures), or implementation of the project in a manner that causes an effect to listed species or designated critical habitat not adequately considered in this opinion may cause coverage of section 7(o)(2) to lapse and require reinitiation of consultation to ensure compliance with section 7(a)(2) of the ESA.

X. REINITIATION NOTICE

This concludes formal consultation on the proposed widening of HWY-101 over Santa Rosa Creek and the installation of fish habitat enhancement structures within Santa Rosa Creek. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

XI. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or develop additional information.

1. NOAA Fisheries recommends that FHWA and Caltrans consult with NOAA Fisheries to develop a long range planning approach that seeks to minimize and avoid the impacts of road related projects on listed salmonids.

XII. LITERATURE CITED

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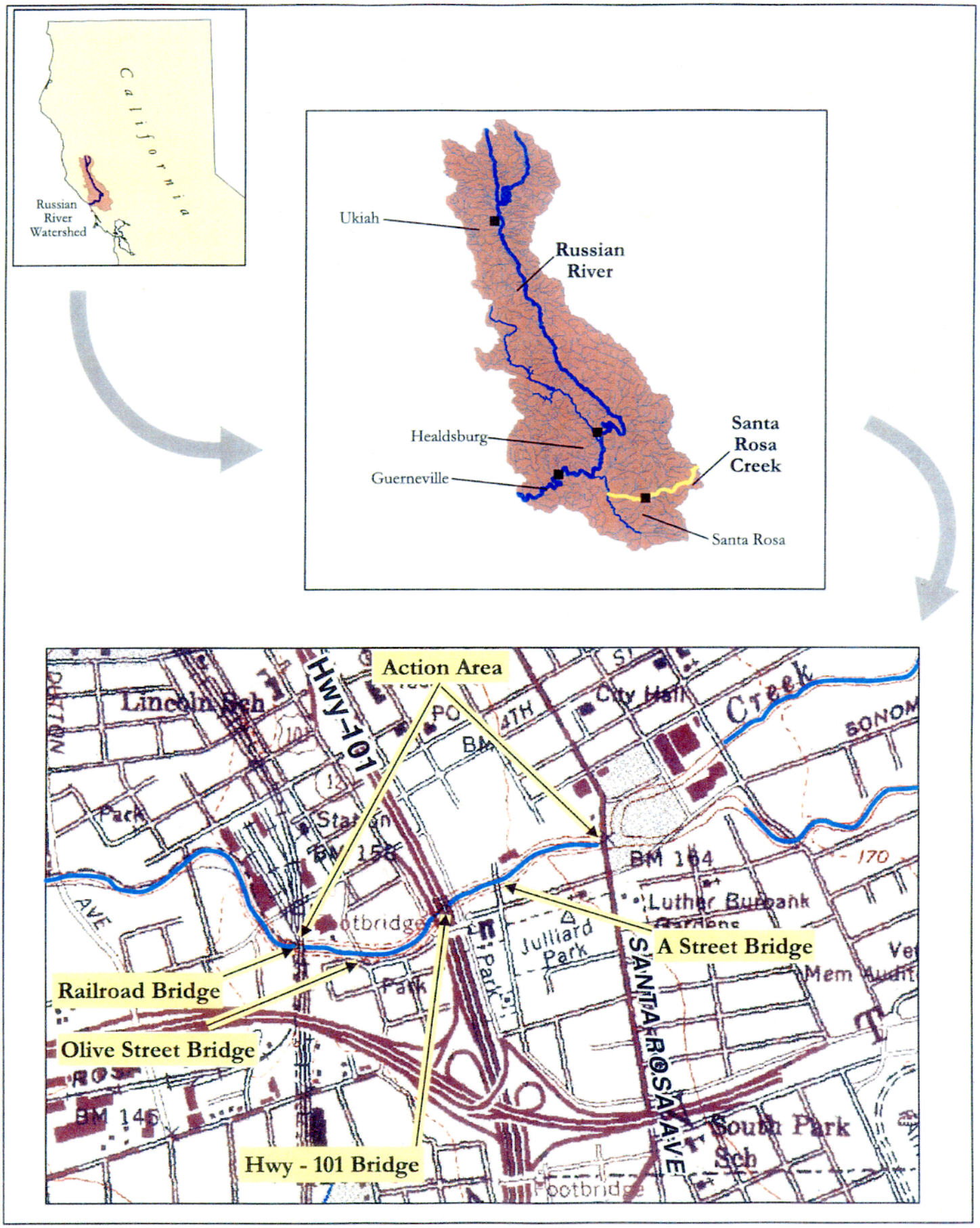

Figure 1. Action Area for Hwy-101 widening over Santa Rosa Creek, Santa Rosa, California.